OPTIMUM®
MASCHINEN - GERMANY

Mounting instruction

Version 1.0

MSSR Linear Encoder

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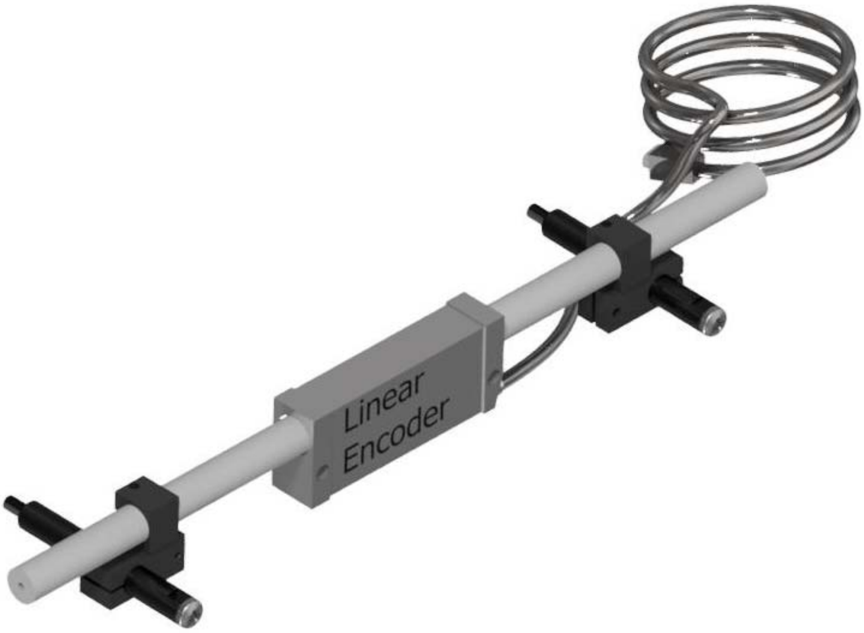
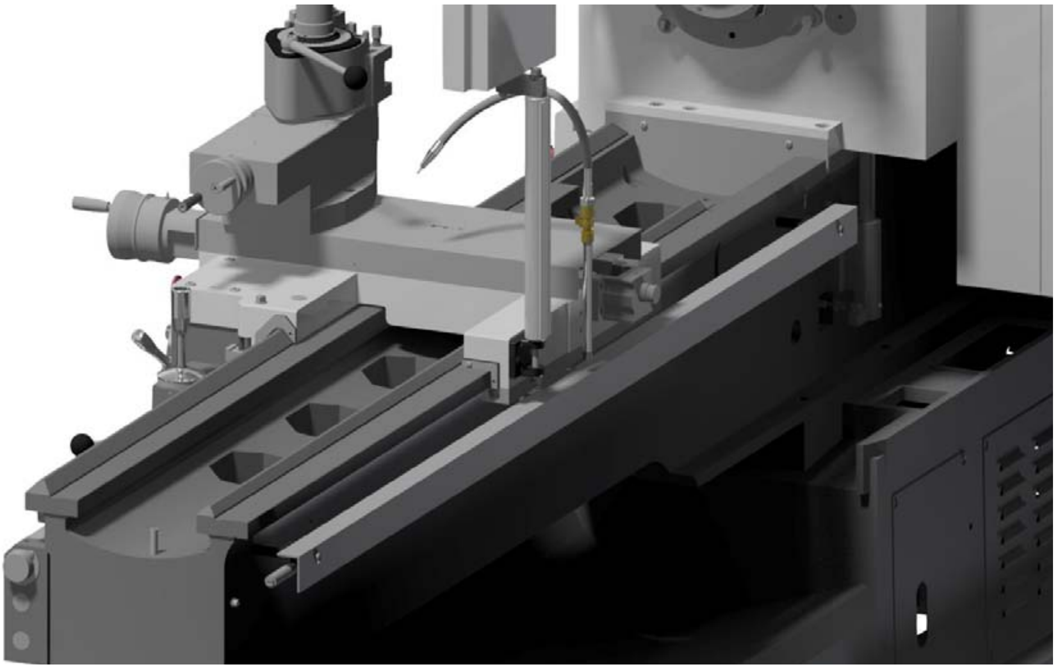


1 Introduction



Img. 1-1: MSSR Linear Encoder

1.1 Preparation

To reduce erroneous readings caused by machine wear, it is recommended that the scale will be mounted as close as possible to the machine lead screw or axis drive shaft.

If the scale holders are mounted facing outwards, the effective scale travel is extended by approx. 40mm. (☞ „Img. 1-1: MSSR Linear Encoder“ on page 2)

For the cable routing of the reading head, it should be taken into account that a longer effective measuring path results in the need for a longer cable.

The total length of the scale is different from the effective measuring distance.

(☞ „Img. 1-2: effective measuring path“ on page 3)

INFORMATION

At the time of writing, the standard cable length is 3 metres for all effective measurement paths. Contact Sales or Purchasing if a different cable length is required instead of an extension cable.
☞ Waterproof terminal box for extension cables on page 8

(See table: effective measuring path)

Table: effective measuring path

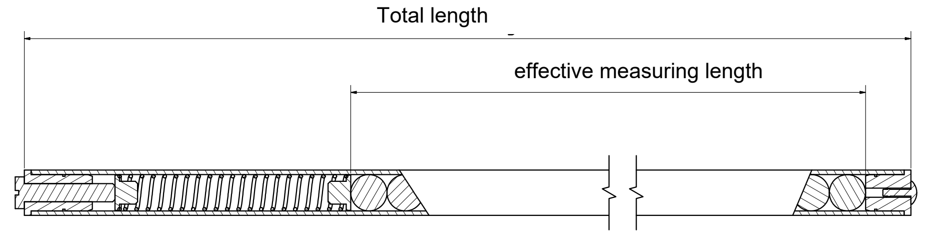
Total length (mm)	effective measuring length (mm)	Item no.
311	51	3384405
362	102	3384410
412	152	3384415
463	203	3384417
514	254	3384419
565	305	3384421
616	356	3384422
666	406	3384423
717	457	3384424
766	506	3384425
819	559	3384426
870	610	3384427
920	660	3384428
971	711	3384429
1022	762	3384430
1073	813	3384431

Table: effective measuring path

Total length (mm)	effective measuring length (mm)	Item no.
1124	864	3384432
1174	914	3384433
1225	965	3384434
1276	1016	3384435
1378	1118	3384437
1428	1168	3384438
1479	1219	3384439
1530	1270	3384440
1581	1321	3384441
1632	1372	3384442
1682	1422	3384443
1733	1473	3384444
1784	1524	3384445
1886	1626	3384446
1987	1727	3384447
2089	1829	3384448
2190	1930	3384449
2292	2032	3384450
2394	2134	3384451
2495	2235	3384452
2597	2337	3384453
2698	2438	3384454
2800	2540	3384455
2902	2642	3384456
3003	2743	3384457
3105	2845	3384458
3206	2946	3384459
3308	3048	3384460

1.2 Effective measuring path

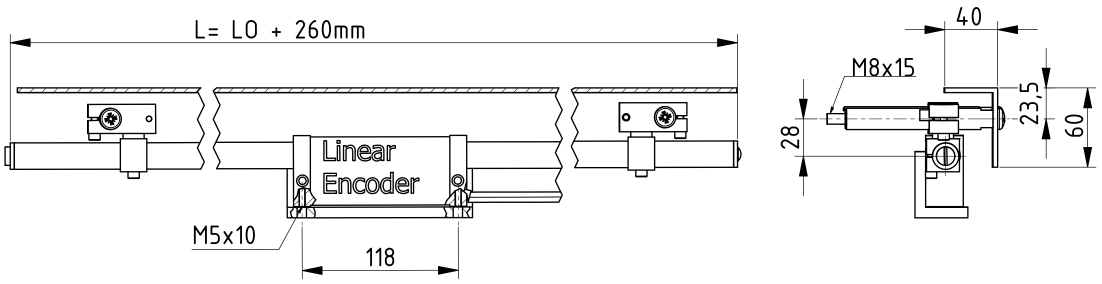
Due to the design of the scale, there is a difference between the actual total length and the effective measuring distance, i.e. the usable length.



Img. 1-2: effective measuring path

1.3 Transducer dimensions

Measuring length L0 (mm)	51-3048
Total length L (mm)	L = LO + 260



Img. 1-3: Dimension of the transducer

1.4 Warnings

If the machine travel is greater than the actual scale travel, it is recommended that mechanical stops are fitted to the machine to prevent damage from overrunning.

As the reading head and scale are precision components, it is important to handle them with care. Permanent damage can occur due to increased bending stress and hard impacts.

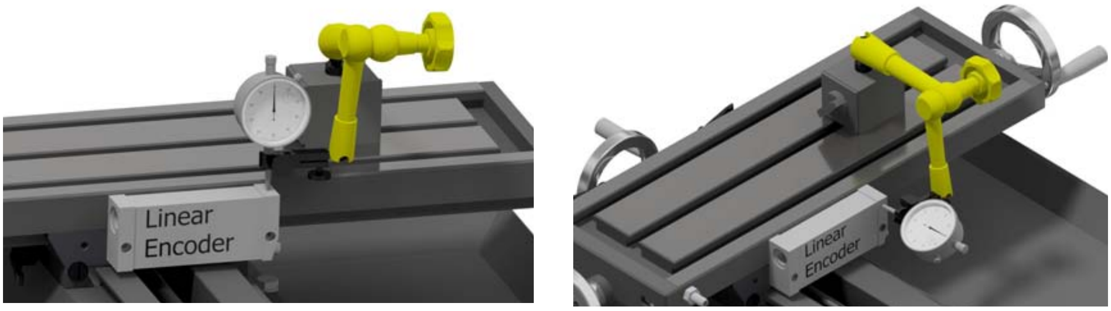
1.5 Technical data

Resolution/Accuracy	Standard: 0.005 mm
Signal output	Analogue
Cable length	Standard cable length 3 m
Resistance to impact	Linear encoder 100 g
Resistance to vibration	Linear encoder 30 g
Protection class	IP 67

2 Installation

2.1 Installation of the reading head

The read head is attached to the machine together with the bracket and is to be fixed there parallel to the axis travel with a maximum deviation of +/-0.05mm. Use a suitable measuring device, e.g. dial gauge, to attach the reading head. Fine adjustments can be made by aligning and tightening the screws on the angle bracket.



Img. 2-1: Installation of the reading head

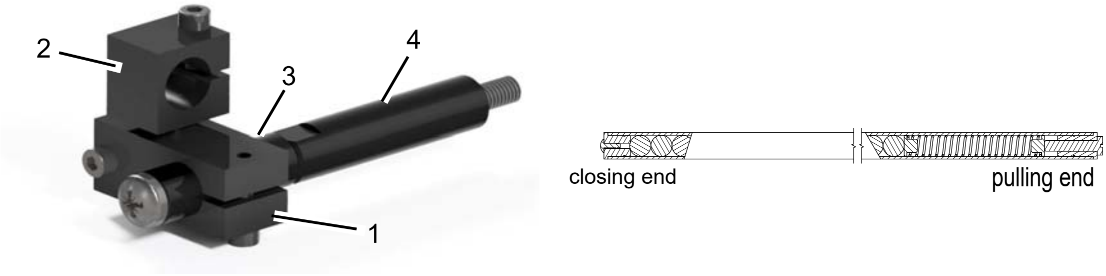
2.2 Installation of the scale

The two ends of the scale are different. The tension end is on the flat-head screw, the clamped end can be seen on the half-round rivet.

INFORMATION

1. Faulty readings result when the reading head moves beyond the effective measuring range limits.
2. The pretension of the balls is set at the factory via the grub screw at the end of the pull. The set screw must not be adjusted as this will change the calibration and accuracy of the scale.
3. When installing scales in the vertical plane, the train end should be at the top.

Once the reading head is attached and correctly aligned, the scale brackets can be attached.



Img. 2-2: Scale holder and scale

No.	Designation	No.	Designation
1	Terminal block	3	short strut
2	Scale holder	4	long strut

Move the machine to its maximum position to the opposite side of the reader head. Maximum position means the full available travel, including winching by hand beyond any electrical limit switches or stops.

Carefully push the scale through the reading head, leaving a sufficient piece of the scale protruding from the reading head to allow the scale holders to be attached.

Fit the terminal block to the scale bracket, leaving a gap of about 3 mm between the lower edge of the bracket shoulder and the upper edge of the terminal block.

Slide the terminal block/holder assembly onto the scale to within about 5 mm of the end of the reader head.

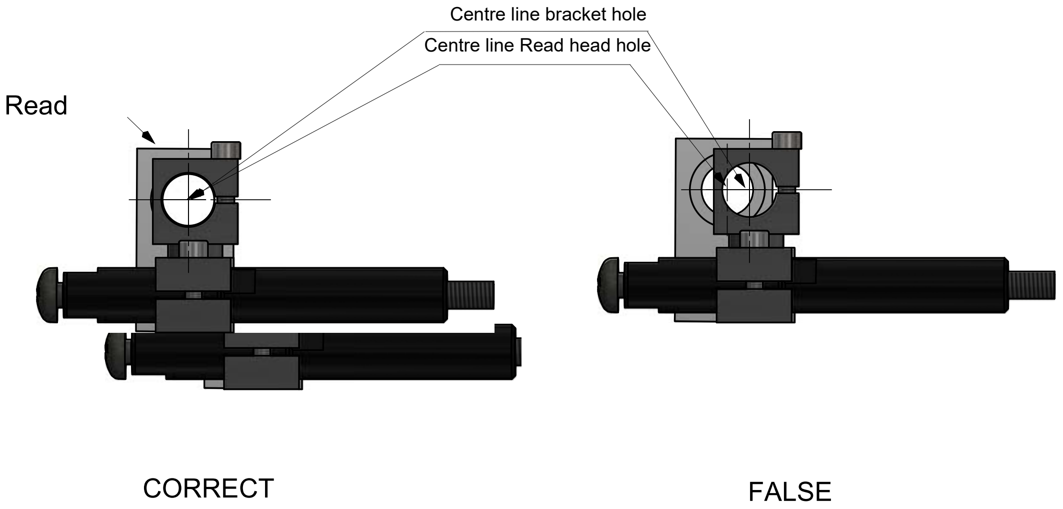
Grain the hole positions. It is important that the terminal block is kept right-angled to its mounting surface at all times.

Remove the terminal block/holder assembly and the scale from the reader head. Drill M8 x 18 mm deep into the machine casting and cut the thread. The strut should be square and flush with the machine surface.

A maximum of two struts can be screwed together to allow sufficient adjustment of the scale. If two struts are not enough to fix the scale, additional brackets are necessary. These holders must be stiff enough to prevent axial movement of the scale.

Place the terminal block/holder assembly loosely on the strut and pass the scale through the reading head and into the scale holder. Carefully slide the scale back and forth 25 - 50 mm through the scale holder while tightening the hexagonal screws on the terminal block. Make sure that the scale slides smoothly through the reading head and into the scale holder. If there is any interference, loosen the hexagonal screws on the terminal block completely and repeat this step.

The centre line hole of the reading head must be directly aligned with the centre line hole of the scale holder. Failure to observe this warning may result in permanent damage to the scale and/ or incorrect readings.



Img. 2-3: Bore alignment

Remove the scale from the reading head and move the machine to its full travel in the opposite direction . Full travel means winching by hand beyond the electric limit switches.

Fit the terminal block to the scale bracket, leaving a gap of about 3mm between the bottom edge of the bracket and the top edge of the terminal block.

Slide the terminal block/bracket assembly onto the scale, ensuring that there is sufficient clearance between the reader head and the terminal block to prevent damage to the reader head cable. Do not attach the scale holder to the scale yet.

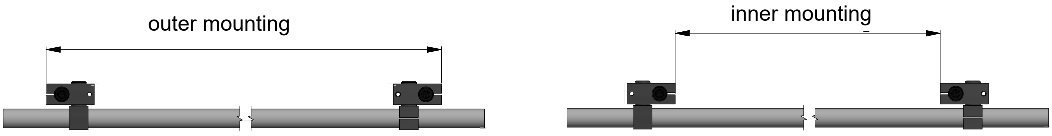
Centre punch through the connection block and into the machine casting. It is important that the terminal block is kept right-angled to its mounting surface at all times.

Remove the terminal block/holder assembly and the scale from the reader head. Drill M8 x 18 mm deep into the machine casting and cut thread as marked by the centre punch. Attach the struts to the machine casting. The strut should fit right-angled and be flush with the machine surface.

Place the terminal block/holder assembly loosely on the strut and pass the scale through the reading head and into the scale holder. Carefully slide the scale back and forth 25 - 50 mm through the scale holder while tightening the hexagonal screws on the terminal block. Make sure that the scale slides smoothly through the reading head and into the scale holder. If there is any interference, loosen the hexagonal screws on the terminal block completely and repeat this step.

Carefully slide the scale through the scale holder, the reading head and into the other scale holder. Fully tighten the hexagon screw of the scale holder at the clamped end of the scale, but only hand-tighten the hexagon screw at the tension end.

2.3 Mounting variants

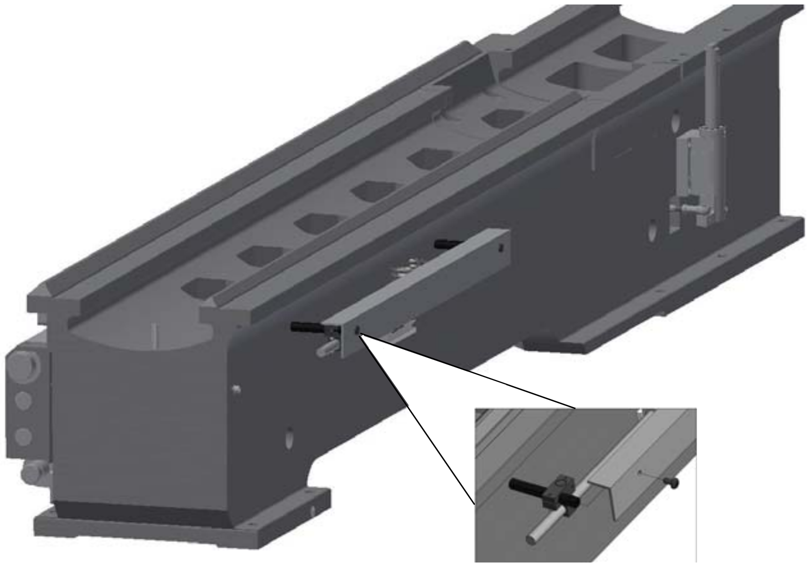


Img. 2-4: Mounting variants

2.4 Fastening the scale cover

Each transducer has a protective cover. This aluminium cover is designed to protect the scale from damage due to impact. The cover can be attached to the machine casting or via the scale struts.

To attach the cover to the struts, measure and mark the distance between the centre of each strut. Drill two 8.5mm dia. holes at each end of the cover. The cover can be attached to the struts using the enclosed half-round head screws. After the cover is attached, move the machine axis to both ends of the travel to ensure that the cover does not collide with or rub against the reader head.



Img. 2-5: Fastening the scale cover

2.5 Cable routing

The cable routing of the reading head is of crucial importance for the trouble-free functioning of the measuring transducer. Sagging and loose cables can get caught or break and cause irreparable damage. Make sure that the cables are attached to the machine carefully and at short intervals. If it is necessary to allow cable loops to protrude along the cable routing, for example as a compensating length at transitions between moving and rigid machine parts, these must not interfere with the movement of the machine or the movement of the transducer.

INFORMATION

The cable is an integral part of the scanning head. Should the cable become damaged, it must be replaced complete with the scanning head.

If cable extensions are required, the connection points must be provided with protective housings. (☞ „Img. 2-6: Protective housing for plug connection of the extension cable, article no. 033841ECB“ on page 8)

If extension cables are used, the plug and socket connection must not be in the chip tray or in the direct flow of coolant or oil. To avoid problems with noise or interference voltages, do not leave the cables over electric motors, fuse boxes or electric pumps.

2.5.1 Waterproof terminal box for extension cables

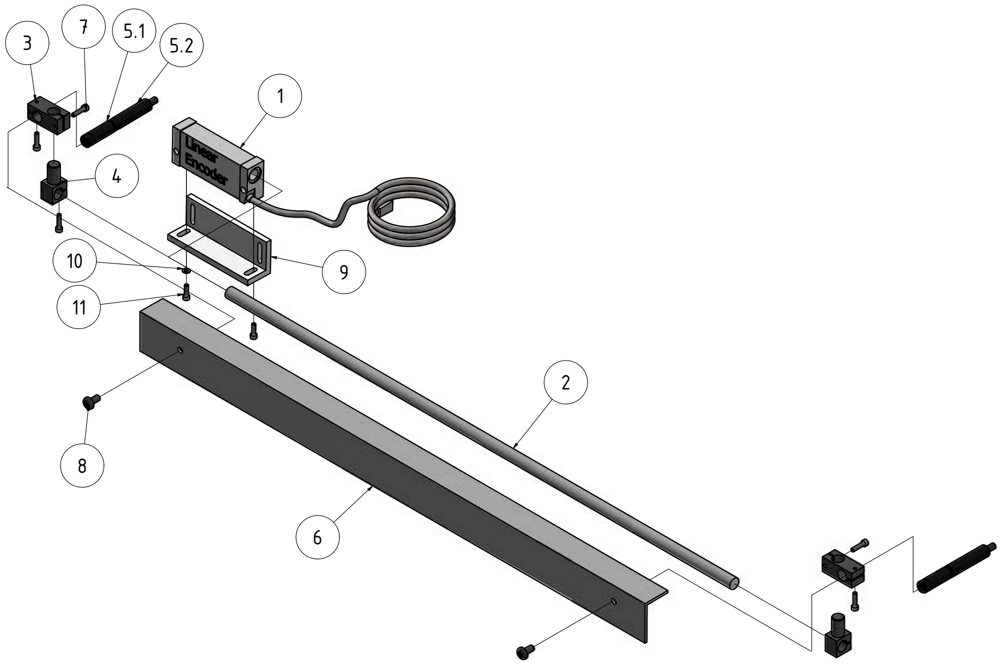
Img. 2-6: Protective housing for plug connection of the extension cable, article no. 033841ECB

3 Final inspection

Before commissioning the transducer, move the machine slowly to both ends of its travel. Check that the cables are secure and that no machine overflow can occur.

4 Ersatzteilzeichnungen - Spare part drawings

A MSSR Messwandler - Linear encoder



Teileliste - Parts list					
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size	Artikelnummer Item no.
01	Lesekopf	Reading head	1		0338440501
02	Kugelmessleiste	Ball measuring bar	1		
03	Anschlussblock zur Aufnahme von Maßstab und Vorrichtung	Connection block for holding scale and fixture	2		0338440503
04	Fester Block für Maßstab und Halterung	Fixed block for scale and holder	2		0338440504
05.1	Installationssäule für Maßstab (vorne)	Installation column for scale (front)	2		0338440505-1
05.2	Installationssäule für Maßstab (hinten)	Installation column for scale (rear)	2		0338440505-2
06	Abdeckplatte für Maßstab und Halterung	Cover plate for scale and holder	1		
07	Schraube M5 x 20	Screw M5 x 20	6	DIN EN ISO 4762 M5 x 20	
08	Schraube M8 x 16	Screw M8 x 16	2	DIN EN ISO 7045 Z M8 x 16	
09	Winkelhalterung	Angle holder	1		0338440509
10	Beilegscheibe	Washer	2	DIN 988 S6	
11	Schraube M6 x 25	Screw M6 x 25	2	DIN EN ISO 4762 M6 x 25	

MSSR_Messwandler_Ersatzteile_Spare_Parts.fm